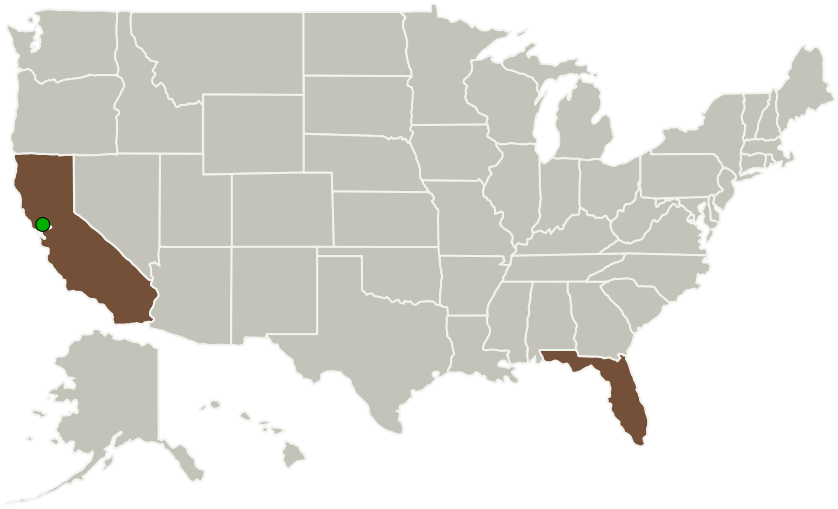
Avionic for Low Altitude High Density SUAS - Dynamic Configurable Dual ADS-B with Interrogation, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

Avionic for Low Altitude High Density SUAS — Dynamic Configurable Dual ADS-B with Interrogation Flight Safety in the NAS consists of multiple layers — Flight Planning, routing, Radar coverage, transponder coverage, and Dual band ADS-B are examples. This proposal will focus on optimization of the existing active RF Dual band ADS-B and transponder system for use with anticipated large numbers of SUAS. SUAS will often be operating in areas and at altitudes that will not be visible to the existing FAA infrastructure. They will also have much higher densities of aircraft than the current infrastructure can handle. This Proposal will investigate the use of very small software defined transceiver technology (under 1 oz) tri-band avionics that include the ability to receive full UAT including ADS-B, ES ADS-B, and Mode A,C, and S transponder responses that can keep track of all transmitting aircraft. The SUAS will also transmit low power UAT ADS-B with dynamically configurable time slots allowing very high density of SUAS. Included will also be the use of a low power —all call— interrogator when the operational area is not already interrogated by a local source.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
R Cubed Engineering, LLC	Lead Organization	Industry Women-Owned Small Business (WOSB)	Palmetto, Florida
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Florida

Project Transitions

June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139764)*

Images

Briefing Chart Image
Avionic for Low Altitude High Density SUAS - Dynamic Configurable Dual ADS-B with Interrogation, Phase I *(https://techport.nasa.gov/image/126393)*

Final Summary Chart Image
Avionic for Low Altitude High Density SUAS - Dynamic Configurable Dual ADS-B with Interrogation, Phase I Project Image *(https://techport.nasa.gov/image/135339)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
R Cubed Engineering, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

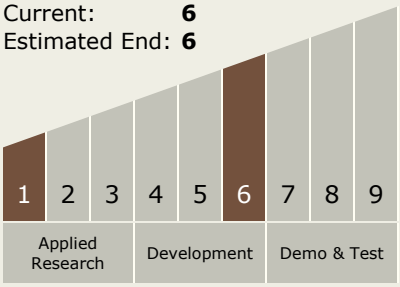
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Vincent M Contarino

Technology Maturity (TRL)

Start: **1**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.2 Turbine Based Combined Cycle

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System